AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1.   (Currently Amended) A method comprising the computer-implemented steps of:

gathering statistics by a database server about XML resources based on said XML resources that are stored in a database repository that is managed by the database server, wherein said statistics characterize a structure of nodes, within a hierarchical structure in which said XML resources are logically organized, under each of one or more particular paths in said hierarchical structure;

storing said statistics; and

in response to a request to the database server for access to one or more XML resources from said database repository, the database server computing a computational cost associated with each of onetwo or more methods of accessing said one or more XML resources from said database repository, based on said statistics.

2.   (Currently Amended) The method of Claim 1, wherein each of said XML resources areis logically organized in a hierarchy of nodes in which each node is either a container or a resource, and

wherein the step of gathering statistics comprises gathering one or more data from a group consisting of

a total number of nodes, in said hierarchyone or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node,

a total number of containers, in said hierarchyone or more hierarchies associated with one or more of said XML resources, that are accessible via a path through saida specified node,

a total number of nodes, in said hierarchyone or more hierarchies associated with one or more of said XML resources, that are accessible via a path through saida specified node and that are in a level of said hierarchyone or more hierarchies that is immediately under a level of said specified node,

a total number of containers, in ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through ~~said~~a specified node and that are in a level of said ~~hierarchy~~one or more hierarchies that is immediately under ~~said~~a level of said specified node, and

a number of levels, from a root node of ~~said hierarchy~~one of one or more hierarchies associated with one or more of said XML resources, at which ~~said~~a specified node is organized in said ~~hierarchy~~one of one or more hierarchies.

3.   (Currently Amended) The method of Claim 1, wherein each of said XML resources ~~are~~is logically organized in a hierarchy of nodes in which each node is either a container or a resource, and

wherein the step of gathering statistics comprises gathering each of

a total number of nodes, in ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through a specified node,

a total number of containers, in ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through ~~said~~a specified node,

a total number of nodes, in ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through ~~said~~a specified node and that are in a level of said ~~hierarchy~~one or more hierarchies that is immediately under a level of said specified node,

a total number of containers, in ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources, that are accessible via a path through ~~said~~a specified node and that are in a level of said ~~hierarchy~~one or more hierarchies that is immediately under ~~said~~a level of said specified node, and

a number of levels, from a root node of ~~said hierarchy~~one of one or more hierarchies associated with one or more of said XML resources, at which

~~said~~a specified node is organized in said ~~hierarchy~~one of one or more hierarchies.

4.   (Original) The method of Claim 1, wherein the step of storing statistics comprises storing said statistics in a relational table of a database of which said database repository is part.

5.   (Original) The method of Claim 4, wherein said relational table is a first relational table that is a different table than a second relational table in which said XML resources are stored in said database repository.

6.   (Original) The method of Claim 4, wherein said relational table is a relational table in which said XML resources are stored in said database repository.

7.   (Original) The method of Claim 1, wherein the step of storing statistics comprises storing said statistics in a hierarchical index table in which said XML resources are indexed to said database repository.

8.   (Original) The method of Claim 1, wherein the step of computing a computational cost comprises computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository.

9.   (Currently Amended) The method of Claim 8, wherein each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources~~resource in said hierarchy~~, in a column of a table in said database repository, and wherein an operator contained in at least one of said one or more predicates is an operator that determines whether a particular XML resource can be located in said database repository through a particular specified path through a portion of ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources.

10.   (Currently Amended) The method of Claim 8, wherein each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources~~resource in said hierarchy~~, in a column of a table in said database repository, and wherein an operator contained in at least one of said one or

more predicates is an operator that determines whether a particular XML resource can be located in said database repository at a terminal location of a particular specified path through a portion of ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources.

11. (Original) The method of Claim 1, wherein the step of computing a computational cost comprises computing a computational cost of traversing, to locate a particular XML resource specified in said request, an index in which said XML resources are indexed to said database repository.

12. (Original) The method of Claim 11, wherein computing said computational cost of traversing an index comprises computing a computational cost associated with one or more CPUs used for said traversing.

13. (Original) The method of Claim 11, wherein computing said computational cost of traversing an index comprises computing a computational cost associated with reading data blocks in which portions of said index are stored.

14. (Original) The method of Claim 11, wherein computing said computational cost of traversing an index comprises computing (a) a computational cost associated with one or more CPUs used for said traversing and (b) a computational cost associated with reading data blocks in which portions of said index are stored.

15. (Original) The method of Claim 1, wherein the step of computing a computational cost comprises (a) computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository and (b) computing a computational cost of traversing, to locate a particular XML resource specified in said request, an index in which said XML resources are indexed to said database repository.

16. (Original) The method of Claim 1, wherein said request for access to one or more XML resources from said database repository is a SQL query.

17. (Currently Amended) The method of Claim 16, wherein each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources~~resource in said hierarchy~~, in a column of a table in said database repository, and wherein said SQL query comprises a mechanism for providing at least one possible path through ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources to each node of said XML resources.

18. (Original) The method of Claim 17, wherein the step of computing a computational cost comprises computing a computational cost component for one or more predicates, from said request, that contain an operator in conjunction with said mechanism acting on said database repository.

19. (Currently Amended) The method of Claim 16, wherein each of said XML resources is logically organized in a hierarchy of nodes and stored, in association with a location of one or more of said XML resources~~resource in said hierarchy~~, in a column of a table in said database repository, and wherein said SQL query comprises a mechanism for providing all possible paths through ~~said hierarchy~~one or more hierarchies associated with one or more of said XML resources to each node of said XML resources.

20. (Original) The method of Claim 19, wherein the step of computing a computational cost comprises computing a computational cost component for one or more predicates, from said request, that contain an operator in conjunction with said mechanism acting on said database repository.

21. (Original) The method of Claim 1, wherein said database repository is part of a relational database management system.

22. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 1.

23. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 2.

24. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 3.

25. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 4.

26. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 5.

27. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 6.

28. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 7.

29. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 8.

30. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 9.

31. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 10.

32. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 11.

33. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 12.

34. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 13.

35. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 14.

36. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 15.

37. (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 16.

38. (Currently Amended) A method comprising the computer-implemented steps of:
    gathering, by a database management system, statistics about how many nodes within one
        or more XML resources that are stored in a repository of said database
        management system satisfy certain criteria, ~~wherein said statistics characterize a~~
        ~~structure of nodes, within a hierarchical structure in which said XML resources~~
        ~~are logically organized, under each of one or more particular paths in said~~
        ~~hierarchical structure~~; and
    storing said statistics in said database management system; and
    the database management system using the statistics to determine how to process a query
        that accesses the one or more XML resources.

39. (Previously Presented) The method of Claim 38, wherein the step of storing comprises storing said statistics as an XML data type in a schema-based table in said database management system.

40. (Currently Amended) The method of Claim 38, wherein said <u>one or more</u> XML resources are logically organized ~~in~~<u>as</u> a hierarchy of nodes in which each node is either a container or a resource, and

wherein the step of gathering statistics comprises gathering each of

a total number of nodes<u>,</u> in ~~said hierarchy~~<u>one or more hierarchies associated with said one or more XML resources,</u> that are accessible via a path through a specified node,

a total number of containers<u>,</u> in ~~said hierarchy~~<u>one or more hierarchies associated with said one or more XML resources,</u> that are accessible via a path through ~~said~~<u>a</u> specified node,

a total number of nodes<u>,</u> in ~~said hierarchy~~<u>one or more hierarchies associated with said one or more XML resources,</u> that are accessible via a path through ~~said~~<u>a</u> specified node and that are in a level of said ~~hierarchy~~<u>one or more hierarchies</u> that is immediately under a level of said specified node, and

a total number of containers<u>,</u> in ~~said hierarchy~~<u>one or more hierarchies associated with said one or more XML resources,</u> that are accessible via a path through ~~said~~<u>a</u> specified node and that are in a level of said ~~hierarchy~~<u>one or more hierarchies</u> that is immediately under ~~said~~<u>a</u> level of said specified node.

41. (Currently Amended) A computer-readable<u> storage</u> medium ~~carrying~~<u>storing</u> one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 38.

42. (Currently Amended) A method comprising the computer-implemented steps of:

in response to a request for access to one or more XML resources from a database repository within a database management system,

accessing, from said database management system, statistics about a structure of a hierarchy ~~in which~~<u>associated with</u> said one or more XML resources ~~are logically organized, wherein said statistics characterize a structure of nodes under each of one or more particular paths in said hierarchical structure~~; and

computing a computational cost associated with each of ~~one~~two or more

methods of accessing said one or more XML resources from said

database repository, based on said statistics.

43.   (Original) The method of Claim 42, wherein the step of computing a computational cost comprises computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository.

44.   (Original) The method of Claim 42, wherein the step of computing a computational cost comprises computing a computational cost of traversing, to locate particular XML resources specified in said request, an index in which said XML resources are indexed to said database repository.

45.   (Original) The method of Claim 42, wherein the step of computing a computational cost comprises (a) computing a selectivity value for each of one or more predicates, from said request, that contain operators on said database repository and (b) computing a computational cost of traversing, to locate a particular XML resource specified in said request, an index in which said XML resources are indexed to said database repository.

46.   (Currently Amended) A computer-readable storage medium ~~carrying~~storing one or more sequences of instructions which, when executed by one or more processors, causes the one or more processors to perform the method recited in Claim 42.

47.   (Currently Amended) A database system comprising:

an XML data repository within a relational database management system; and

a query optimizer that ~~receives~~is configured to receive a database query and, in response to said query, ~~formulates~~formulate a query execution plan based on computational costs of access paths associated with XML data stored in said repository, wherein said computational costs are based on statistics characterizing an organizational structure of ~~nodes under each of one or more particular paths of an organizational structure of~~said XML data.

48.   (Currently Amended) A system comprising:

means for gathering statistics by a database server about XML resources that are stored in a database repository that is managed by the database server, ~~wherein said statistics characterize a structure of nodes, within a hierarchical structure in which said XML resources are logically organized, under each of one or more particular paths in said hierarchical structure~~;

means for storing said statistics; and

means for computing, in response to a request to the database server for access to one or more XML resources from said database repository and based on said statistics, a computational cost, by the database server, associated with each of ~~one~~two or more methods of accessing said one or more XML resources from said database repository.

49.   (New) The method of Claim 1, wherein each of said XML resources is logically organized in a hierarchy of nodes, and wherein the step of gathering statistics comprises gathering statistics about a median depth of a plurality of paths to a plurality of nodes in one or more hierarchies associated with one or more of said XML resources, and wherein the plurality of nodes are accessible via a path through a specified node.

50.   (New) The method of Claim 1, wherein each of said XML resources is logically organized in a hierarchy of nodes, and wherein the step of gathering statistics comprises gathering statistics about a maximum depth of a plurality of paths to a plurality of nodes in one or more hierarchies associated with one or more of said XML resources, and wherein the plurality of nodes are accessible via a path through a specified node.